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Is there a correlation between Water Potential and Mechanical Strength of stems of *Malosma laurina*?

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**Abstract**

The purpose of this experiment was to see if there was a correlation between water potential and the stem mechanical strength of the *Malosma laurina*. This experiment was conducted with the use of a Scholander-Hammel pressure chamber to find water potential and the Instron 5500 to test the mechanical strength of the stems. After analysis of the data, there was no direct correlation between water potential and the mechanical strength of stems of *Malosma laurina*.

**Methods**

Samples of *Malosma laurina* were collected from the Dana Martel Trail on the Pepperdine University campus. Ten samples were collected from ten different *Malosma laurina* plants. Samples with similar stem sizes and location relative to the base of the plant were chosen in order to have consistency. Five were collected, bagged, and stored in an ice chest to begin experimentation immediately while the other five were set out to dry for 24 hours. The Scholander-Hammel pressure chamber was used with the leaves to test water potential. The Instron 5500 was then used to measure the modulus of elasticity, maximum flexure load, modulus of rupture, modulus of elasticity with bark, and the modulus of rupture with bark. The sample with the pressure chamber and Instron were conducted on the five dehydrated samples after the twenty four hours (in order to ensure dehydration). The results were then put into a graph (water potential in bars versus flexure strength/flexure strain in N/mm) and a two paired t-test was conducted for analysis.

**Results**

Graph 1 plots water potential versus mechanical strength; there is no visual pattern in the graph that shows a correlation. Table 1 represents the collected data with averages and standard deviations. After conducting the paired t-test (two tail=0.272, >0.05), it was calculated however that there is no correlation between water potential and stem mechanical strength of *M. laurina*.

**Discussion**

The objective of this research experiment, which was to see if there was a correlation between water potential and stem mechanical strength of *M. laurina*, was achieved. After statistical analysis, there was no correlation between water potential and the stem mechanical strength (ratio of flexure strength to flexure strain). The two paired t-test shows that there is no direct correlation between water potential and mechanical strength. The two tail t value was 0.272; it needed to be below 0.05 in order to prove that there was a correlation. Through this experiment, it can be thought that stem mechanical strength of *M. laurina* is not a clear result of the hydrated status of the plant. Stem mechanical strength can be affected by so many other factors that would need further experimentation with a bigger testing pool.

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